

C L A I M S

1. A radio base station apparatus which is  
2 used in a mobile radio communication system in which a  
3 plurality of radio terminals are simultaneously  
4 call-connected and the number of radio terminals which  
5 can be connected varies depending on an amount of  
6 interference, and exchanges baseband  
7 transmission/reception signals with an external radio  
8 device which performs radio communication with the radio  
9 terminals, characterized by comprising:

10           a plurality of channel circuits which are  
11 respectively provided for radio channels used in the  
12 mobile radio communication system, convert transmission  
13 data, which are to be transmitted to radio terminals  
14 call-connected through the radio channels, into baseband  
15 transmission signals, output the signals to the external  
16 radio device with arbitrary transmission power, and  
17 output baseband reception signals from the external  
18 radio device as reception data from the radio terminals;

19           loopback test means for testing a transmission  
20 function or a reception function of an arbitrary channel  
21 circuit by looping back a predetermined test signal,  
22 inside the apparatus, which is output from a  
23 transmitting-side channel circuit, of said channel  
24 circuits, which serves as a transmitting side in a  
25 loopback test, and by receiving the test signal through  
26 a receiving-side channel circuit of said channel

27   circuits which serves as a receiving side in the  
28   loopback test; and  
29                    a control unit which determines transmission  
30   power for the test signal in accordance with the number  
31   of call connections of a radio terminal call-connected  
32   to said apparatus in the loopback test, and indicates  
33   the transmission power to said transmitting-side channel  
34   circuit.

2                   2. A radio base station apparatus according  
3   to claim 1, characterized in that said control unit  
4   increases/decreases the transmission power of the test  
5   signal in accordance with an increase/decrease in the  
6   number of call connections, when the transmission power  
7   is determined.

2                   3. A radio base station apparatus according  
3   to claim 1, characterized in that in determining  
4   transmission power for the test signal, said control  
5   unit selects, as the transmission power, transmission  
6   power which satisfies, at least at the time of the  
7   number of call connections, a ratio between the test  
8   signal and an interference noise sum (SIR: Signal to  
9   Interference Ratio) which is obtained when the  
10   transmission power of the test signal is made equal to  
11   that of a radio terminal of interest when the number of  
12   call connections is 1.

2                   4. An radio base station apparatus according  
3   to claim 1, characterized in that said loopback test

3 means comprises:

4                   a test data generating circuit which supplies

5 test data used for a loopback test to said

6 transmitting-side channel circuit;

7                   a selection circuit which loops back the test

8 signal, as a reception signal, from said

9 transmitting-side channel circuit to said receiving-side

10 channel circuit on the basis of the test data; and

11                   a test data comparison circuit which compares

12 the test data supplied from said test data generating

13 circuit with reception data of the test signal output

14 from said receiving-side channel circuit.

5. A radio base station apparatus according

2 to claim 1, characterized in that said channel circuit

3 comprises:

4                   a power control circuit which adjusts

5 transmission power of a transmission signal to the radio

6 terminal in accordance with a request bit multiplexed on

7 reception data from the radio terminal;

8                   a bit multiplexing circuit which multiplexes

9 an instruction bit, which instructs the radio terminal

10 to adjust transmission power, on transmission data to

11 the radio terminal on the basis of a ratio between a

12 reception signal from the radio terminal and an

13 interference noise sum (SIR: Signal to Interference

14 Ratio); and

15                   a test signal power control circuit which

16     adjusts the transmission power of the test signal in  
17     accordance with an instruction from said control  
18     circuit.

6.     A radio base station apparatus loopback  
2     test method which tests a transmission function or a  
3     reception function of a radio base station apparatus by  
4     transmitting/receiving a predetermined test signal upon  
5     looping back the signal inside the radio base station  
6     apparatus, said loopback test method being used in a  
7     mobile radio communication system in which a plurality  
8     of radio terminals are simultaneously call-connected and  
9     the number of radio terminals which can be connected  
10    varies depending on an amount of interference and  
11    exchanges baseband transmission/reception signals with  
12    an external radio device which performs radio  
13    communication with the radio terminals, characterized by  
14    comprising:

15                 the step of testing the transmission function  
16    or the reception function of the apparatus by  
17    transmitting/receiving a predetermined test signal upon  
18    looping back the signal inside the apparatus;

19                 the step of determining transmission power for  
20    the test signal in accordance with the number of call  
21    connections of a radio terminal in the radio base  
22    station apparatus; and

23                 the step of adjusting the transmission power  
24    of the test signal on the basis of the transmission

25 power.

7. A radio base station apparatus loopback  
2 test method according to claim 6, characterized in that  
3 the step of determining the transmission power comprises  
4 the step of increasing/decreasing the transmission power  
5 of the test signal in accordance with an  
6 increase/decrease in the number of call connections.

8. A radio base station apparatus loopback  
2 test method according to claim 6, characterized in that  
3 the step of determining the transmission power comprises  
4 the step of selecting, as the transmission power,  
5 transmission power which satisfies, at least at the time  
6 of the number of call connections, a ratio between the  
7 test signal and an interference noise sum (SIR: Signal  
8 to Interference Ratio) which is obtained when the  
9 transmission power of the test signal is made equal to  
10 that of a radio terminal of interest when the number of  
11 call connections is 1.

9. A radio base station apparatus loopback  
2 test method according to claim 6, characterized in that  
3 the step of determining the transmission power comprises  
4 the step of using, as the transmission power of the test  
5 signal, transmission power of a transmission signal  
6 transmitted to the radio terminal when the number of  
7 call connections is 1, when the number of call  
8 connections is less than 16.

10. A radio base station apparatus according

2 to claim 6, characterized in that the step of  
3 determining the transmission power comprises the step of  
4 using, as the transmission power of the test signal,  
5 power obtained by adding 1 dB to transmission power of a  
6 transmission signal which is transmitted to the radio  
7 terminal when the call connection count is 1, when the  
8 number of call connections is not less than 16 and less  
9 than 32.

11. A radio base station apparatus loopback back  
2 method, characterized in that the step of determining  
3 the transmission power comprises the step of using, as  
4 the transmission power of the test signal, power  
5 obtained by adding 3 dB to transmission power of a  
6 transmission signal which is transmitted to the radio  
7 terminal when the call connection count is 1, when the  
8 number of call connections is not less than 32 and less  
9 than 64.

12. A radio base station apparatus loopback back  
2 method, characterized in that the step of determining  
3 the transmission power comprises the step of using, as  
4 the transmission power of the test signal, power  
5 obtained by adding 18 dB to transmission power of a  
6 transmission signal which is transmitted to the radio  
7 terminal when the call connection count is 1, when the  
8 number of call connections is not less than 64.